



TUTCO[®]

HEATING SOLUTIONS GROUP

Duct Heater Product Catalog

Quick Turn & Expedited Options

- Standard lead time - 10 business days
- Expedited shipments in 1 - 6 business days

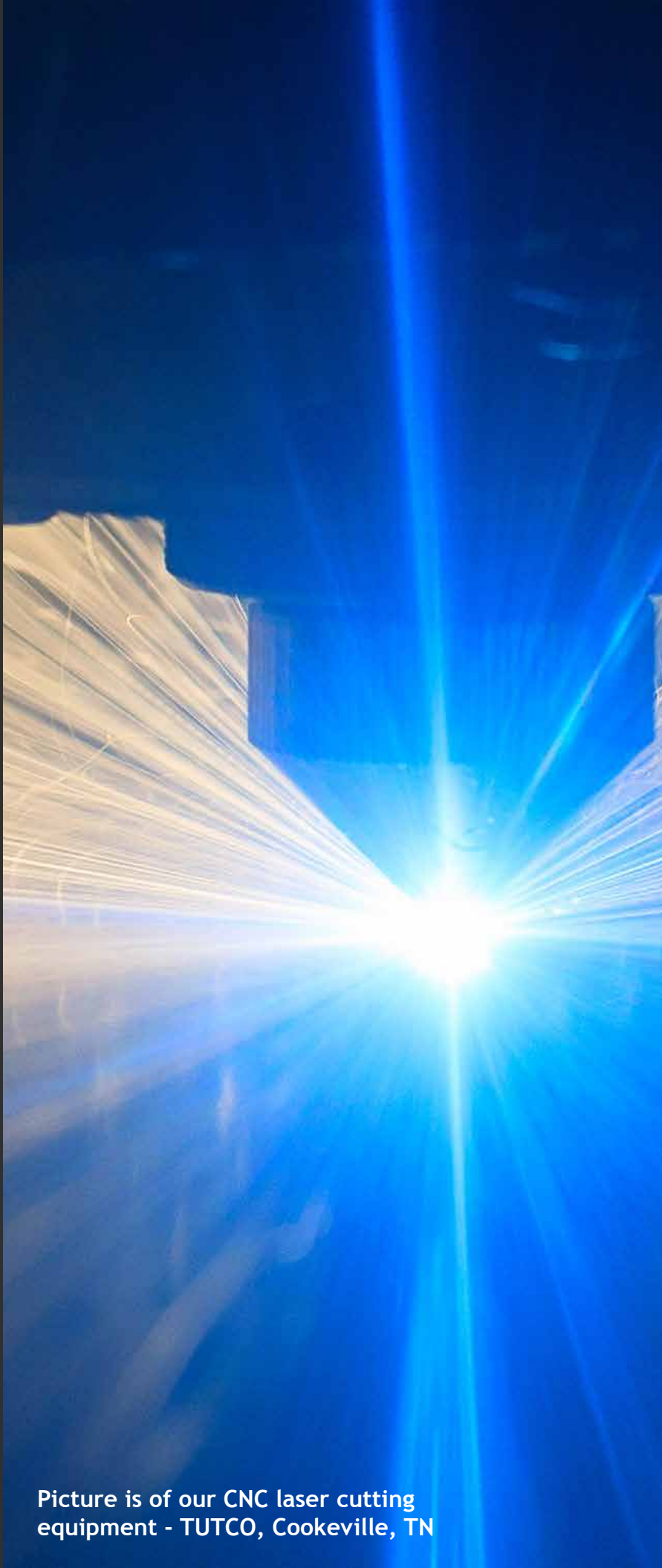
WHO WE ARE...

Our parent company, Smiths Group plc, employs over 23,000 people in more than 50 countries throughout its five divisions - John Crane, Smiths Medical, Smiths Detection, Smiths Interconnect and Flex-Tek. For over 160 years, Smiths Group has been at the forefront of technology and continues to touch the lives of millions of people every day.

Our objectives are to apply leading-edge technology to design, manufacture and deliver innovative solutions that meet our customers' needs. We do this across a wide range of applications and markets - from health care, energy and petrochemicals to threat and contraband detection, telecommunications, aerospace and specialty equipment manufacturing. Our proprietary products and services are critical to our customers' operations, while our commitment to high levels of service create competitive advantages.

www.smiths.com

smiths



Picture is of our CNC laser cutting equipment - TUTCO, Cookeville, TN

THE HEATING SOLUTIONS GROUP

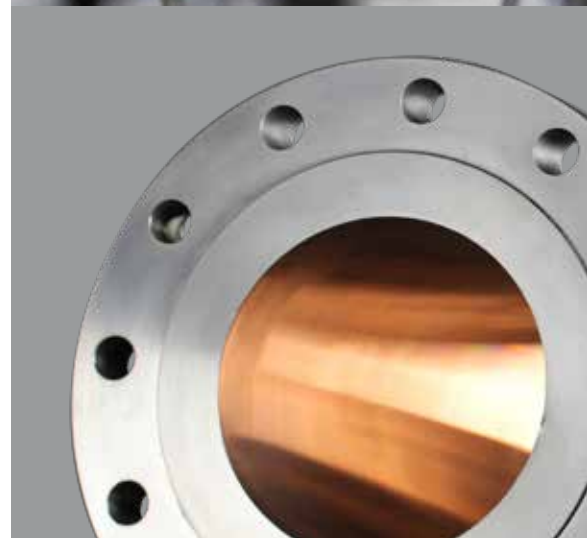
In today's fast-paced business environment, customer expectations are high and product life cycles are short. Reliable manufacturing partners are necessary to bring products to market on time. Tutco is the world's largest supplier of open coil heating elements. Our experience, coupled with cutting edge facilities, has proven to be our keys to success. As a result, ideas can become reality within weeks.

Tutco continues to grow its portfolio of innovative heating products and solutions. For more information about our brands please visit our website.

www.tutco.com



SureHeat



ELECTRIC DUCT AIR HEATERS

Our unique design provides free flow of air and the lowest pressure drop through the heating elements.

Applications:

- Primary Heating
- Secondary Heating
- Space Heating
- Auxillary Heating
- Reheating
- Multi-zone and VAV Heating

Key Benefits:

- **Greater Convenience and Accessibility** - TutQuotes quoting software allows you to easily build a quote and get your bids out quicker!
- **Increased Versatility** - The E-Series Flip-Able Duct Heater line has been specifically designed, developed and tested with symmetry in mind eliminating the need for right and left handed designs. This one heater may be installed in four different positions.
- **Refined Efficiency** - This product also offers higher duct to heat coverage, and more kilowatt options in all sizes compared to the competition.
- **Established Certifications** - UL 1996 Listed with UL and ETL.



E-SERIES (EDH) PAGE 6 & 7

EDH Flip-Able Duct Heater solutions are engineered with symmetry in mind. The versatile slip-in installation eliminates the need to order a duct heater designed for right and left handed configurations. E-SERIES products can be installed in four different positions.

E-SERIES (EVH) PAGE 8 & 9

The EVH products have the same versatility designed for use with Variable Air Volume systems (VAV). VAV systems typically vary the air flow rate in response to the changing heat and cooling loads for the space. Single duct with re-heat is often used to supply supplemental heat to specific zones. TUTCO EVH heaters are UL and ETL listed for installation as an accessory for single duct terminal units.

ROUND DUCT OPTIONS 9

Available in 6", 8" and 10" diameters, R-SERIES products are inline UL listed duct heating solutions built for easy installation with flexible or rigid ductwork. Airflow can move in either direction offering superior installation flexibility.

ACCESSORIES PAGE 10 & 11

From contactors, specialty switches, power and safety fusing, SSRs and controllers, Tutco supplies engineered heating solutions customized for each project and required specification.



E-SERIES EDH DUCT HEATERS

E-SERIES EDH heaters can be installed in 4 different orientations into the duct work. The flip-able design installs through a slot or via a flanged frame eliminating the need for a right or left handed solution. The supported wire rack design provides very low pressure drop and excellent duct to heater element coverage. The E-SERIES EDH integrated control panel housing offers hinged and latched access doors. All electrical components, except for the SSR / SCR products, are neatly arranged inside the control panel box. Products are UL 1996 listed products by UL and ETL. Custom configurations include outdoor panels with dust tight weather-resistant construction, separate remote panels and offset or bottom mount control panel configurations.

KEY FEATURES

- UL and ETL Listed for use as a standalone heater
- Flip-Able design, airflow in any direction, designed for zero clearance
- Standard Watt density of 30 kW/FT
- Max height of 144" and max width of 120"
- Variable CFM requirement based on inlet air temp
- Convenient online quoting through TutQuotes saves time and money

OPTIONS & ACCESSORIES

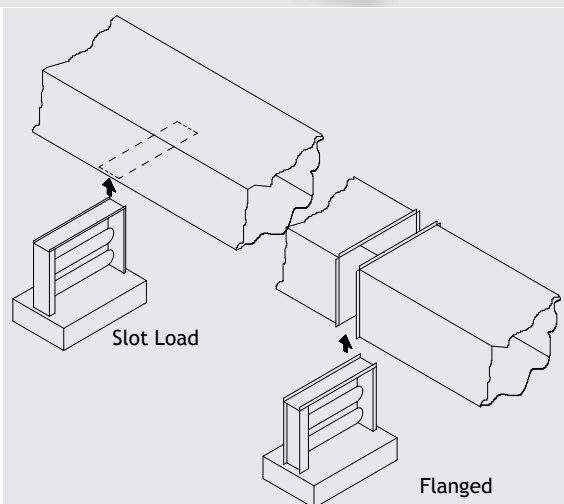
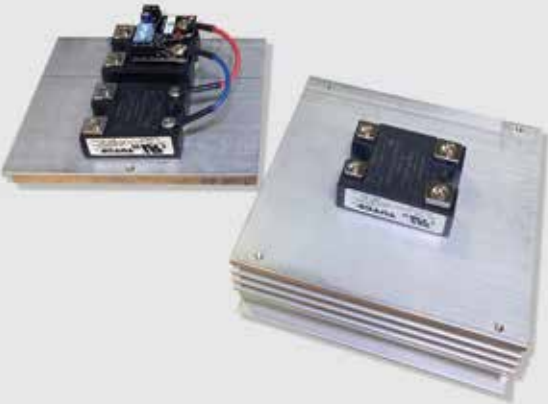
- Precise solid state SSR /SCR Control
- Electronic sequential 12 Step Controller
- Derated Heating Coils improve heater element life and nuisance tripping
- NEC compliant Disconnect Switch
- Integrated 24V Transformer eliminates control wire runs
- Power Fusing is available for heaters drawing less than 48A
- Airflow Switch is an air pressure device designed to diable the heater when the system has no or low airflow

OUTDOOR & REMOTE PANELS

- UL listed for outdoor use
- Designed for Zero Clearance
- Options on NEMA4 or NEMA4x rated control panel.
- All outdoor heaters require power fusing.
- Please contact factory for further information

BOTTOM MOUNT PANEL OPTIONS

- UL listed for use in a bottom mount application
- Designed for hard to access areas
- Please contact factory for further information



A close-up photograph of several parallel metal threaded rods. Each rod is secured with a white plastic spacer or nut. The rods are arranged in a grid-like pattern, and the background is a blurred red surface.

E-SERIES EVH DUCT HEATERS

Like the EDH products, the EVH features our patented Flip-Able design. Four different installation positions are possible and eliminate the need for ordering right or left handed products. Built for Variable Air Volume (VAV) single duct applications, the E-SERIES EVH duct heaters simply slip into a slot cut into the ductwork or via a flanged option. For EVH flange mount heaters, the air diffuser/radiant screen must be on the *inlet air side*. The EVH heater should be installed a minimum distance of 20" from the air damper valve. The E-SERIES EVH integrated control panel has hinged and latched access doors. All electrical control components, except for the SSR / SCR products, are neatly arranged inside the control panel box. Products are UL 1996 listed products by UL and ETL.



KEY FEATURES

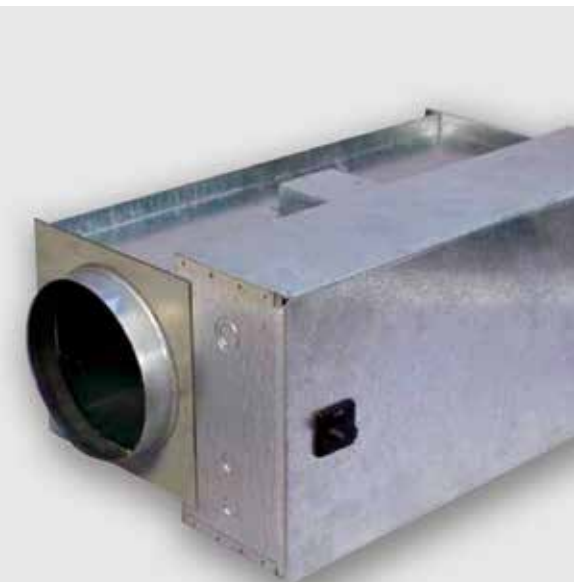
- UL and ETL Listed for use as a standalone heater
- Flip-Able design, airflow in any direction, designed for zero clearance
- Standard Watt density of 16.5 kW/FT
- Max height of 20" and max width of 40"
- Variable CFM requirement based on inlet air temp
- Convenient online quoting through TutQuotes saves time and money



OPTIONS & ACCESSORIES

- Precise solid state SSR /SCR Control
- Electronic sequential 12 Step Controller
- Derated Heating Coils improve heater element life and nuisance tripping
- NEC compliant Disconnect Switch
- Integrated 24V Transformer eliminates control wire runs
- Power Fusing is available for heaters drawing less than 48A
- Airflow Switch prevents power to the heater if the air from the fan / blower isn't detected

ROUND DUCT HEATER OPTIONS



KEY FEATURES

- Single phase - 120V, 208V, 240V, 277V, 346V, 480V
- Three phase - 208V, 240V, 480V, 600V
- Available in 6", 8" and 10" diameters, designed for zero clearance
- Directly mount flexible ductwork (min 250°F /121°C rated)
- Air can flow in either direction
- Designed for up to 100° F/37° C inlet air
- Wide range of kW options available

E-SERIES ACCESSORIES

At the core of every resistive heating solution is its control panel. A poorly designed control panel can be the difference between poor performance, a short product life-span and unsafe working conditions. Like all Smiths Group plc companies, TUTCO takes this responsibility very serious. All of our products are built to the highest quality standards and current electrical codes.

UL labels are important for the following reasons:

1. Industrial building inspectors REQUIRE them. Equipment installations can be rejected for not adhering to NEC codes.
2. Knowing the equipment and the accesories are built to quality standards and will not interfere with normal operations minimises troubleshooting assuring peace of mind.
3. It's SAFER. Remember, check the label.

<http://database.ul.com>



MAGNETIC CONTACTORS

- Standard in all Duct Heaters
- Used for primary and back up control
- UL approved for 250,000 cycles



SSR / SCR

- Precision power and heat output
- Noiseless, stepless modulation
- Commonly used with 2-10VDC T-stat or 4-20ma signals



ELECTRONIC STEP CONTROLLERS

- Seamless 12 step control sequencing
- Commonly used with 2-10VDC T-stat or 4-20ma signals



TERMINAL BLOCKS & CONNECTIONS

- All blocks are sized for Copper AWG conductors
- Standard connection accepts up to: (1) 500 MCM line per pole
- >500 MCM line per pole uses a (2) MCM line main power terminal
- Low voltage control terminal boards are supplied



DISCONNECT SWITCHES

- Unfused interlocking disconnect switch available for 384A max on control panel door
- Not available on Bottom Mount heaters



AIR FLOW SWITCHES

- Prevents voltage to the heater element when the fan isn't on
- Serves as an alternate fan interlock switch
- Adjustable option - $.05'' \pm .02''$ to 12" WC pressure
- Non-adjustable requires a minimum of $.07''$ WC pressure



TRANSFORMER

- Use when control voltage differs from line voltage
- Primary over current protection
- Class 1 must have primary side protection by fusing
- Class 2 have internal protection and don't require fusing



POWER FUSING

- Required in all heaters drawing 48A or more
- Optional on heaters less than 48A

E-SERIES

Minimum Air Velocities

General:

A. The minimum airflow in a duct heater is directly related to the inlet air temperature. Consideration must be given to both airflow across the heater and the inlet temperature.

B. To calculate the watts per sq. ft. of duct area, divide the total watts required by the duct area.

Example:

C. Duct size equals 2 ft. x 3 ft., total watts equal 20,000 watts per square foot equals $20,000 / 6 = 3333$

D. If the air handling equipment is expressed in FPM, then a direct cross reference can be made by comparing the temperature of the air (as it enters the duct heater) to the kW rating on the table at the rated air velocity.

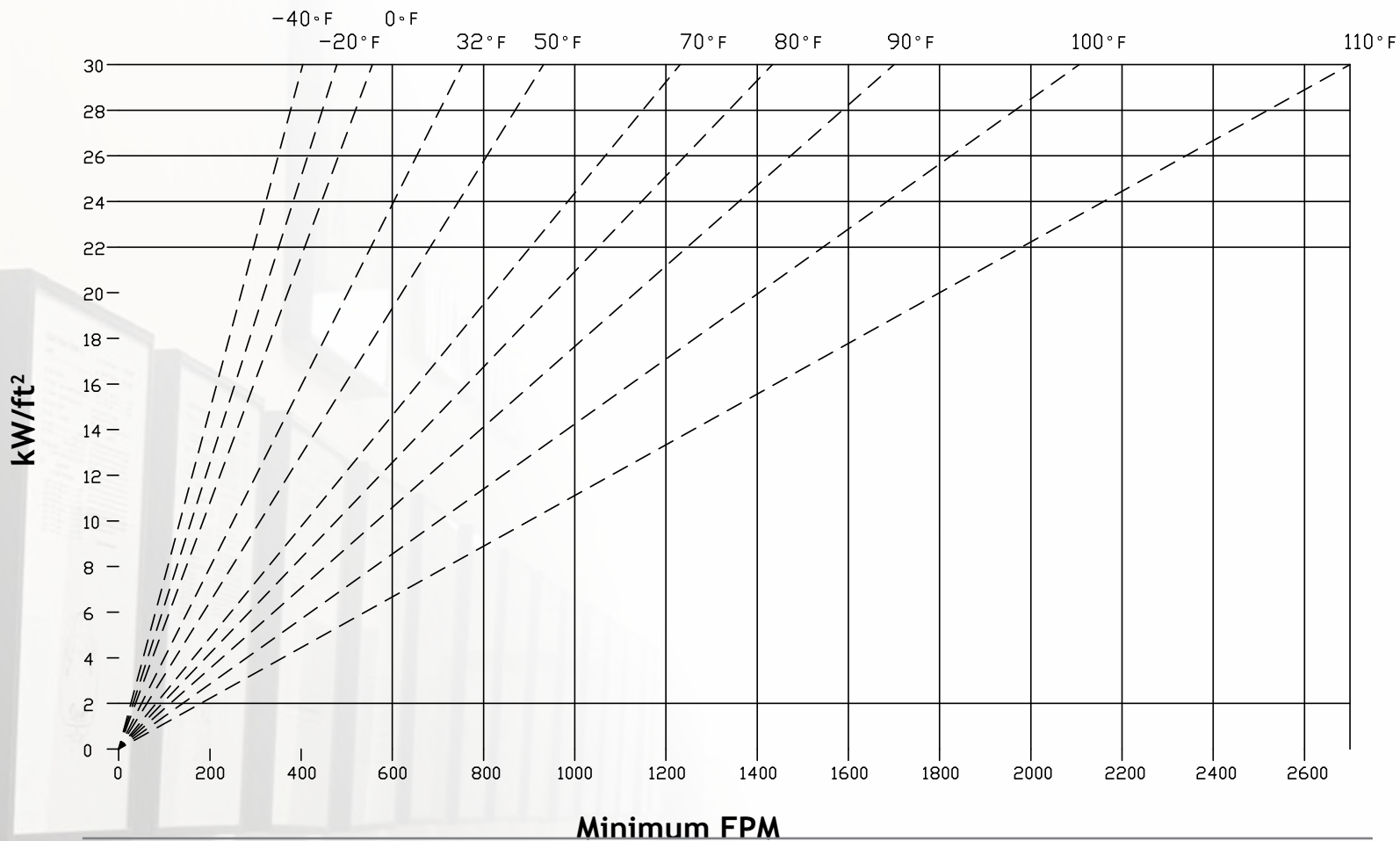
1. Draw a line horizontally from the kW/ft² required to the inlet air temperature being used. (FPM vs. kW/ft²)

2. From this point of intersection on the inlet temperature line, draw a line down vertically to establish the air velocity.

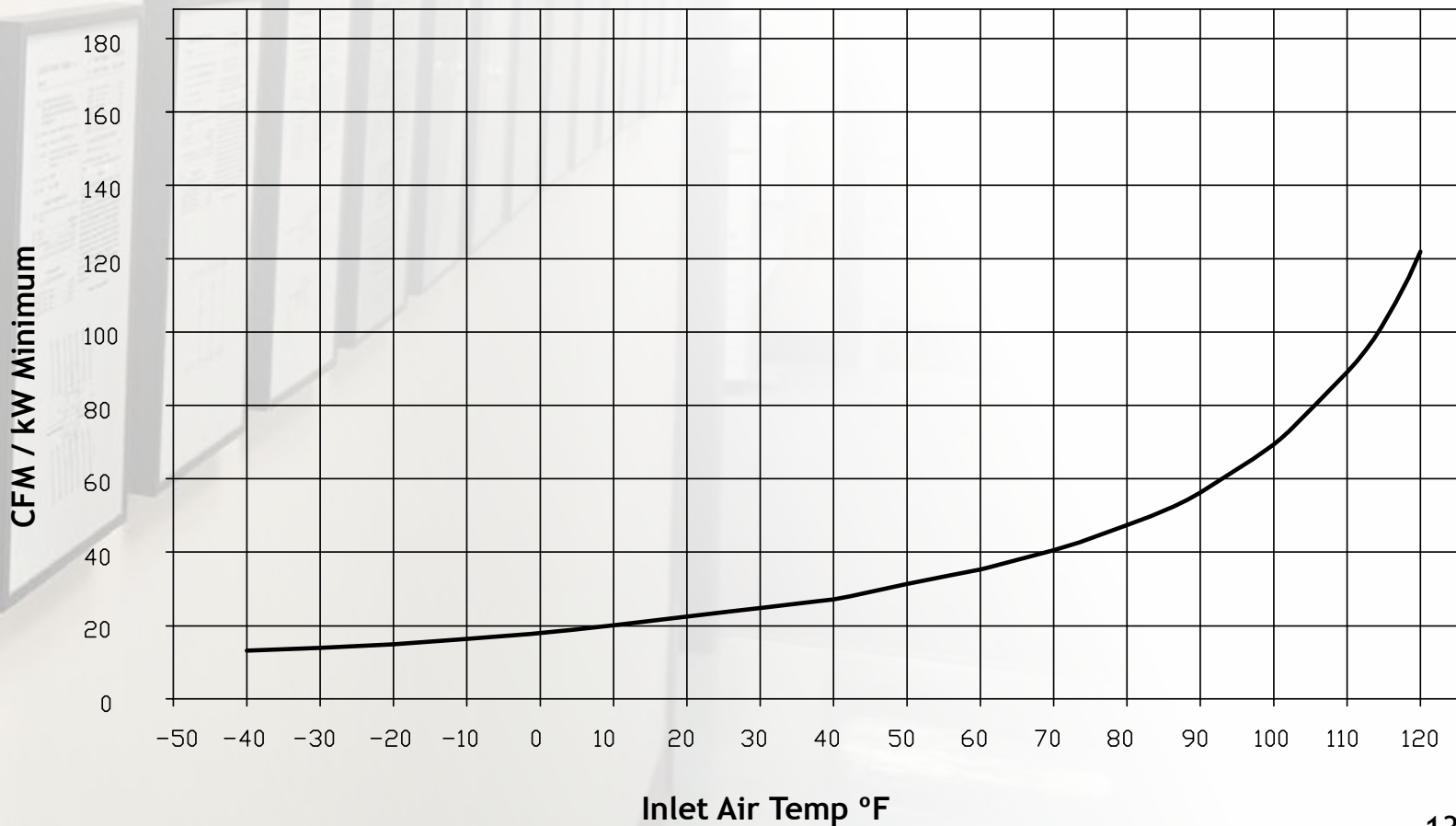
3. In cases where the velocity is less than that determined from the chart, then either the velocity must be increased, the kW required must be reduced or both must be done.

E. In cases where the airflow is expressed in CFM, convert to FPM by dividing the CFM by the duct area. $CFM / \text{Duct Area} = FPM$

FPM vs. kW/ft²



Inlet Air °F vs CFM /kW Minimum



E-SERIES Quality / Warranty

Quality Control

Each heater is dielectrically tested per UL 1996 section 43 Production Line Dielectric Voltage-Withstand Tests. A functional electrical test is performed on every heater by applying control voltage and energizing all control circuits. The resistance of all heaters is measured and must be within $\pm 5\%$ of rated value.

The Highest Standard

Tutco incorporates Six Sigma and Lean practices to ensure product quality. Our continued improvement efforts have resulted in zero defects for the majority of customers over multiple quarters. TUTCO has earned several Outstanding Quality awards and Certified Supplier status from some of the largest and most demanding brand name manufacturers in the world. TUTCO is ISO[®] 14001:2015 Certified.

6σ

Warranty

1.) These warranty terms apply to Seller's stand-alone Duct Heaters and the individual components therein ("Product"). 2.) Seller warrants to the first purchaser of the Product listed on the purchase order ("Buyer") and does not extend to any subsequent purchaser of the Product when installed correctly according to instructions/requirements provided by Seller, and when properly maintained, will be free from defects in workmanship and materials for one (1) year after date of manufacture ("Warranty"). 3.) This warranty does not apply to defects caused by Buyer's faulty installation, misuse, accident, alteration, improper care after installation, or chemical, electrical or physical abuse of the Product. 4.) If the Product is found not to comply with the above Warranty, the defective Product shall be promptly returned, freight prepaid, to Seller's factory for examination. Seller reserves the right to determine its obligation under this Warranty by testing the Product and/or components at Seller's manufacturing facility for any for alleged defect. Return transportation of Product shall be prepaid by Buyer, and Seller will issue a credit to Buyer for the return transportation if it is determined by Seller that the Product is defective. 5.) The obligation of Seller for defective Product is limited to making repairs at Seller's facility or replacing the Product or individual components therein. If the failure is due to Seller's workmanship or an individual component or components fail in the Product, Seller will repair, or at its option replace the component(s) found to be defective or at no charge and issue a credit to Buyer for the return transportation. 6.) This Warranty does not include labor which may be required to diagnose the trouble, remove or install the Product or any replacement components at Buyer's location where the Product is installed, nor does it include any transportation expenses for Seller's employees to diagnose the trouble, remove or install the Product or any replacement components at the Buyer's location where the Product is installed. Seller reserves the right to inspect installation of Product in person, or hire a third party approved by Seller to inspect installation of the Product. 7.) The foregoing is Seller's sole warranty and the Buyer's exclusive remedy. 8.) Any modifications made to the Product without specific prior written authorization from Seller will void Seller's Warranty. 9.) Warranty claims will be processed via Seller's Return Material Authorization procedure. To obtain Warranty services and/or component replacement, Buyer must notify Seller's customer service of an alleged defect within the applicable Warranty period.

THE ABOVE WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, STATUTORY OR OTHERWISE, EXPRESS OR IMPLIED. ALL OTHER REPRESENTATIONS TO THE BUYER, AND ALL OTHER OBLIGATIONS OR LIABILITIES WITH RESPECT TO ANY PRODUCT PURCHASED HEREBY, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND SELLERS OBLIGATION UNDER ALL SUCH WARRANTIES SHALL NOT EXCEED THOSE SET FORTH ABOVE. NO OTHER WARRANTY OR REPRESENTATION WHATSOEVER, EXPRESS OR IMPLIED, HAS BEEN MADE BY SELLER WHICH HAS BEEN RELIED ON BY THE BUYER. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY DIRECT OR INDIRECT DAMAGES OTHER THAN AS SET FORTH ABOVE OR FOR LOSS OF PROFITS OR OTHER INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES.



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